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AUTHOR McAlonie, Mary Lynne; Wolf, Judith M.
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ABSTRACT

Five severely retarded emotionally disturbed children (2-7 years old) were exposed to a prelanguage sensorimotor program for 20 weeks. The program emphasized the use of exploratory behavior and gesture imitation. Results suggested that object permanence could be encouraged using these activities but that the approach used in training imitative behavior may have been inappropriate. (Author)

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A Prelanguage Program for Five Severely Retarded Children[1]

Mary Lynne McAlonie[2]
Judith M. Wolf[2]

Federal legislation mandates the education of all handicapped children including the severely retarded. Those who staff programs for the severely mentally retarded are consistently confronted with the problem of defining an appropriate program for this population. Traditional assessment techniques used to define areas of strengths and weaknesses in children with mild handicaps are numerous. However, such assessment tools are often too sophisticated conceptually or too complex verbally to be functional with a population of severely retarded children. While progress continues in the development of techniques for training the severely retarded in institutional settings, curricula for the early stimulation of children in non-institutional settings are limited especially in the areas of cognitive and language skills. Furthermore, issues have been raised by educators regarding both the nature of such curricula and methodologies employed. Some believe that the focus of a program for severely retarded children should be functional in nature and that academic orientation is inappropriate. Methodology for stimulating language development in severely retarded populations differs; some emphasize development of oral speech production; some employ a multimodality approach including gesture language as well as speech. It would seem an issue common to all such problems is being ignored. That is, does the severely retarded child have the most basic and prerequisite skills to profit from programming of any kind, specifically language development experiences?

Piaget's conception of intellectual development as the organization of sequential steps into a functional hierarchy suggests that later developments presume earlier ones (1936, 1937, 1945). Hunt (1973) suggests that certain

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specific skills constitute the earliest sensori-motor roots of language. Several investigators (Wohlwill, 1966; Woodward, 1959, 1961, 1962) have shown interest in the sensori-motor development of the severely retarded child, but most studies employing a Piagetian model with handicapped children have focused on the later preoperational and concrete operational stages (Friedlander, McCarthy and Soforenka, 1967; Wachs, 1970). However, Bricker and Bricker (1973) have more recently discussed the importance of sensori-motor learning as a basis for language development in the young child. They assert the "importance of prelinguistic forms of behavior for subsequent language acquisition...these processes which are not linguistic in a formal sense, and certainly not verbal, constitute the necessary basis for the development of functional language" (p. 24).

The purpose of this study is to investigate the training of prelinguistic sensori-motor skills as a prerequisite for language development in a select group of severely retarded, nonverbal children. Two basic skills, object permanence and imitation, were selected for a training program. These skills are frequently cited as prerequisites to the development of language in children (Bricker and Bricker, 1973; Hunt, 1973; Paraskevopoulos and Hunt, 1971). The specific objectives of the study are twofold: to encourage the development of object permanence through the training of exploratory behavior in five severely retarded children, and to stimulate imitative behavior through the training of gesture imitation.

Method

Selection of Subjects

All day activity centers serving severely retarded children in the East Metropolitan Day Activity Center Council (EMDACC) were asked to submit names of children who satisfied the following criteria:

- can see and focus but does not consistently follow a moving object with eyes,
- has use of hands,
- has no imitative behaviors,
- has no spontaneous manipulative exploratory behaviors, or
- is nonverbal

From teacher recommendations and conferences conducted between each teacher and the language development consultant, five children were selected as pilot subjects for an experimental prelanguage program. Descriptive information on the five children who participated in the study appears in Table 1. This information was taken from the children's files and from the observational data collected on each child. All of the children identified showed some atypical behaviors such as frequent head banging, continuous rocking, arm and hand sucking and biting, high-pitched whining, eye aversion, body spinning and other highly inappropriate behaviors, as well as moderate to severe levels of retardation.

Procedure

A group training session was held to orient the teachers to the prelanguage curriculum and programmed lessons were distributed for each child. Three memoranda sent during the course of the study provided additional information to the participating teachers, and a site visit was made to each teacher-child dyad to observe the program and offer advice and suggestions to the teacher. Due to the prescribed nature of the curriculum, the teacher's instructional role was limited.

Object permanence and imitation were taught using a sequential series of lessons designed to encourage the development of prelinguistic skills. It was decided that the development of object permanence could be best

Table 1

Descriptive Information on Program Children

Subject No.	CA	Estimated MA (in years)	Sex	Residence	Etiology	Disturbed Behaviors
1	4.3	2.0	F	natural	Trisomy 17-18 mosaic	rocking, high-pitched whining, eye aversion
2	6.3	2.1	F	foster	Down's syndrome Trisomy 21	rocking, posturing, head banging, hair pulling, arm sucking, eye aversion
3	6.8	2.0	M	Children's Group Home	Down's syndrome Trisomy 21	staring, head banging hand biting
4	2.7	1.0	M	natural	Cornelia de Lange syndrome	avoids eye contact
5	3.3	1.5	F	natural	unknown	eye aversion, hand flapping, staring

facilitated by lessons stressing sensori-motor manipulation and exploration. This portion of the program offered a sequential series of lessons using cognitive toys, e.g., stacking toy, pegboard, blocks, etc. It was decided that imitation could best be taught through the use of reinforced manual guidance of simple motor gestures. The manually guided response would be reinforced until a motor imitation occurred spontaneously after being presented with a model from the teacher. After the process of imitation was established, vocal and later verbal stimuli would be paired with motor stimuli to elicit imitative vocalization.

Programs were designed so that a criterion level of 80 percent would be required for each desired response. Teachers were instructed to be redundant and continue to offer the stimulus item until a response was obtained consistently to criterion. Reinforcement was offered contingently on a 100 percent schedule. Initially all teachers were directed to use a physical contact, a verbal reinforcer plus food for each reinforced response. As the program proceeded, many teachers dropped the food reinforcement, reporting it to be too distracting and messy for many of the children. Verbal with tactile reinforcement was continued on a 100 percent schedule throughout the program.

Children received 20 minutes of the prelanguage program three times weekly for 18 weeks. During each 20-minute session, teachers were instructed to offer the object permanence sequence for the first half of the session in order to encourage eye contact and foster teacher-child interaction. The second half of each session consisted of the imitation sequence. It was thought that the teacher would have a better chance of serving as an imitative model after working with the child and toys for the first 10 minutes of the session. Teachers were encouraged to work with each child individually with a minimum amount of classroom distraction. The same teachers remained

in the program for the 18 weeks. They were required to keep two kinds of records on their child: a count sheet of number of stimulus offerings and number of child responses per session, and a graph completed each week on each child plotting the number of spontaneous responses emitted by the child.

Tables 2 and 3 display the subskill steps contained in each of the program units. Teachers were instructed to teach each skill utilizing the following approach: First, a new skill would be manually guided; the skill would then be offered through an imitative model; the next approach would be to offer the skill though verbal instructions; finally, the child would be encouraged to emit a spontaneous response. This procedure for offering stimuli was followed throughout the project as each new skill (or subskill) was introduced.

Assessment Procedure

The Uzgiris-Hunt Scales (1966) were selected as the pre- and posttest instrument. These scales measure early cognitive behaviors in very small increments. They are based on Piaget's six sensori-motor schemata and can serve as an alternative measure of cognitive development for very young or very low functioning children. Although normative data are not yet available using the scales, they have been used to identify early cognitive skills in normal (Uzgiris, 1973), deaf (Best and Roberts, 1975) and retarded individuals (Wachs, 1970).

Although the Uzgiris-Hunt Scales measure six different sensori-motor skill areas, only three scales were selected for use in this study. The available literature on prelinguistic behaviors (Paraskevopoulos and Hunt, 1971) suggests that the Verbal Imitation and Object Permanence scales relate most directly to prelinguistic behavior. These scales were administered to the children as a pre- and postmeasure. An experienced tester and one scorer were

Table 2

Object Permanence Skill Sequence
1. Eye contact
2. Visual tracking
3. Reaching and grasping
4. Exploratory behavior of a single object
5. Exploration with appropriate action dictated by the object (e.g., pegboard)
6. Generalized exploratory behavior to other objects with dictated appropriate actions.
7. Spontaneous exploratory behavior involving actions offered by a model to be imitated.

Table 3

Imitation Skill Sequence
1. Imitation of visible body actions
2. Stabilize motor imitation
3. Vowel imitation
4. Babbling vocal play
5. Expand and stabilize babbling vocal play
6. Single word verbal imitation paired with motor actions.
7. Noun label verbal imitation

hired to administer the three scales and the same testing team (one tester and one scorer) administered all pre- and posttests to all children. The testing team remained "blind" to the purposes of the study. Administration rules appearing in the Uzgiris-Hunt materials were followed, and all children were individually tested in a room separate from their classroom. Scoring instructions do not accompany the test, so an arbitrary decision that two correct responses for the required three offerings of each item was selected as criterion for a correct response on each item.

Results

Due to the diversity of the subjects included in the program and the overall purposes of the study, results for each child were analyzed individually. The purpose of individual analysis was to gain some insight into the interaction of subject and program for each child included in the study.

Figures 1 through 5 show the pre- and postmeasure scores for each child. Four of the five children showed gains on the Object Permanence scale, but no consistent pattern could be seen in the Gesture Imitation or Verbal Imitation scales from pre- to posttest. Implications for the overall lack of imitative ability as shown in the Uzgiris-Hunt measure will be discussed in the discussion section of this paper.

Figures 6 through 15 display the responses collected by teachers on each child during the course of the lessons. Children received a mean number of 42 lessons over 18 to 20 weeks. Teachers were instructed to count the number of stimulus opportunities provided the child in each lesson and the number of manually guided or spontaneous child responses.

Subject 1 on Object Permanence (Figures 6) received a mean of 20 stimulus offerings per lesson, responded spontaneously to these opportunities a mean

FIGURE 1

Subject 1. Pretest/Posttest Scores

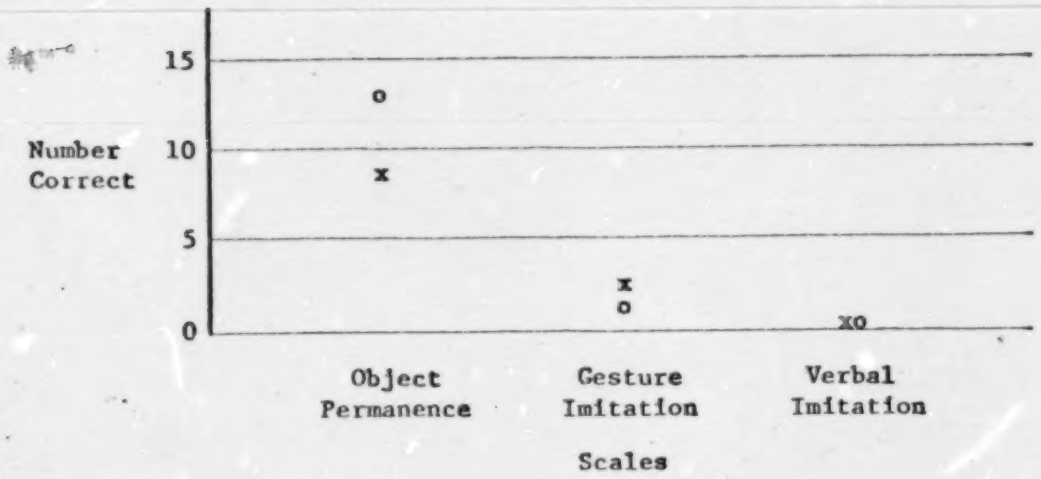


FIGURE 2

Subject 2. Pretest/Posttest Scores

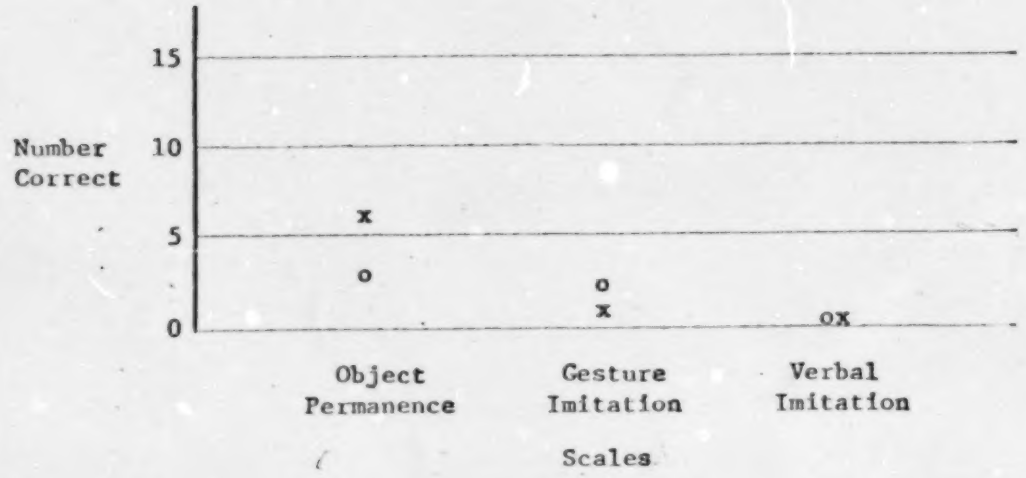


FIGURE 3

Subject 3. Pretest/Posttest Scores

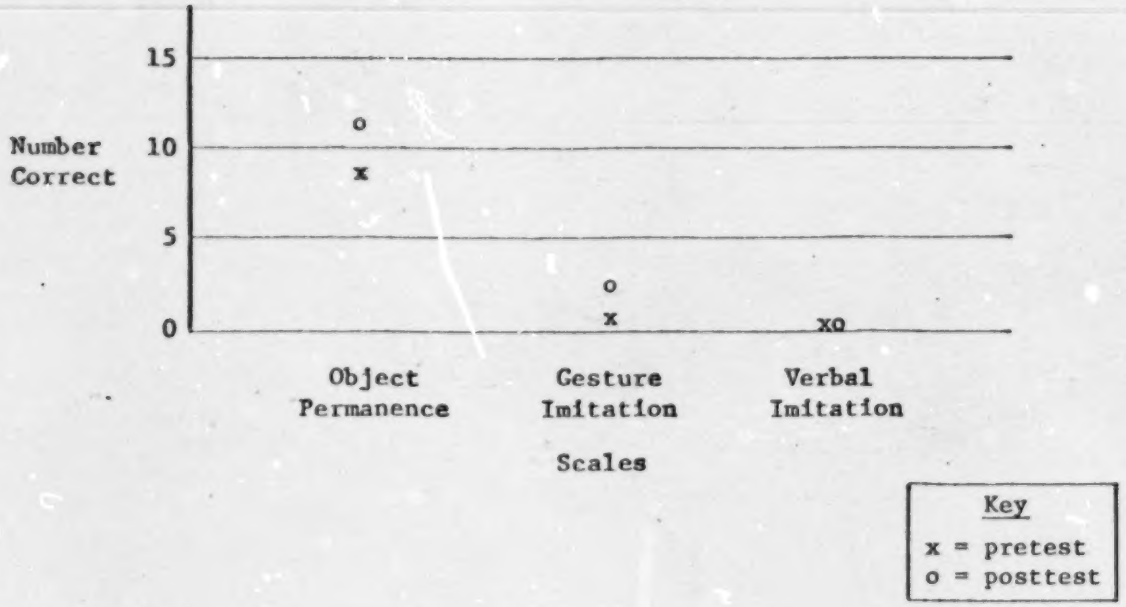


FIGURE 4

Subject 4. Pretest/Posttest Scores

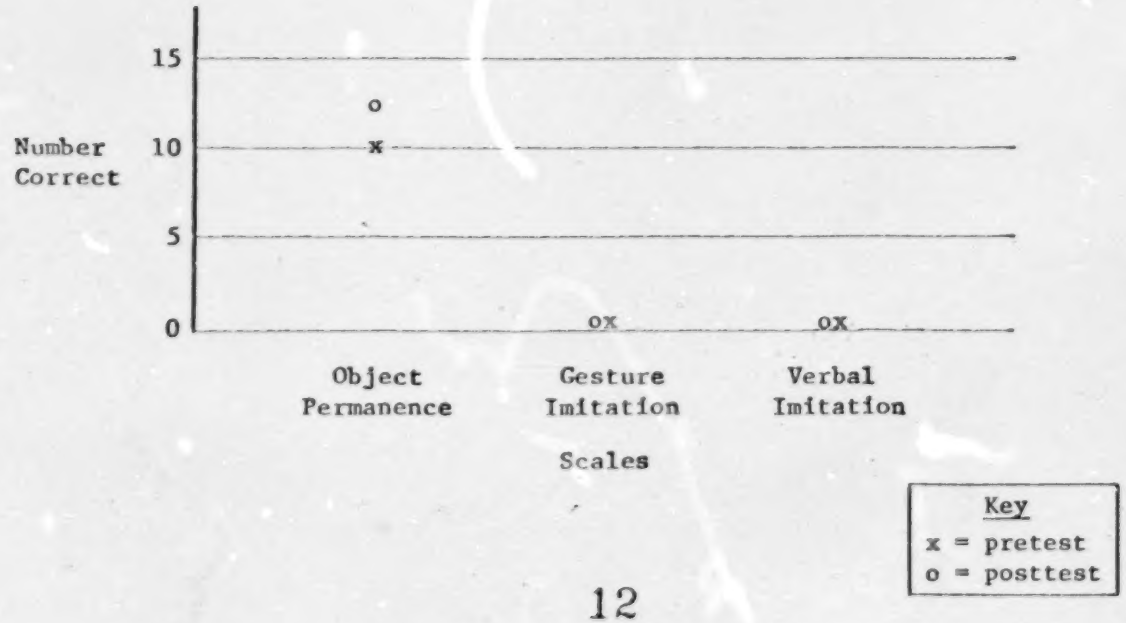


FIGURE 5

Subject 5. Pretest/Posttest Scores

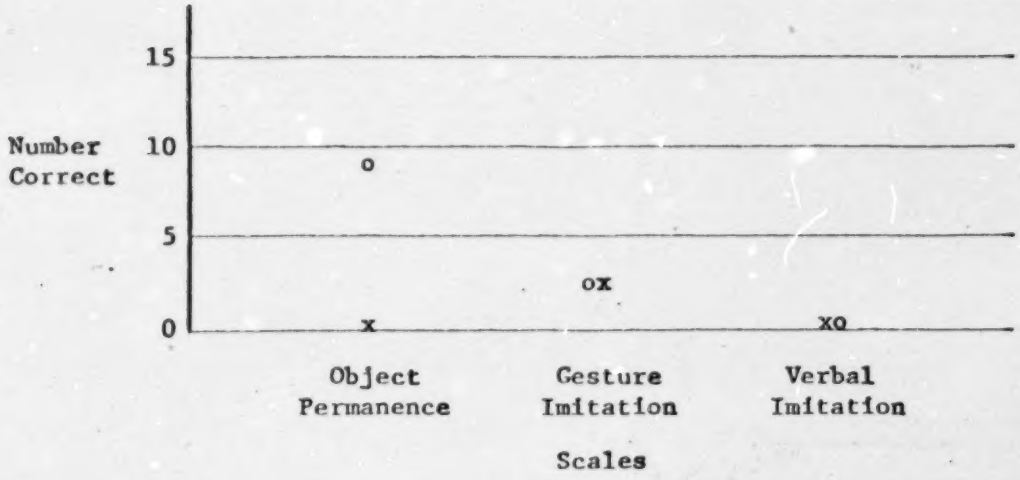


FIGURE 6

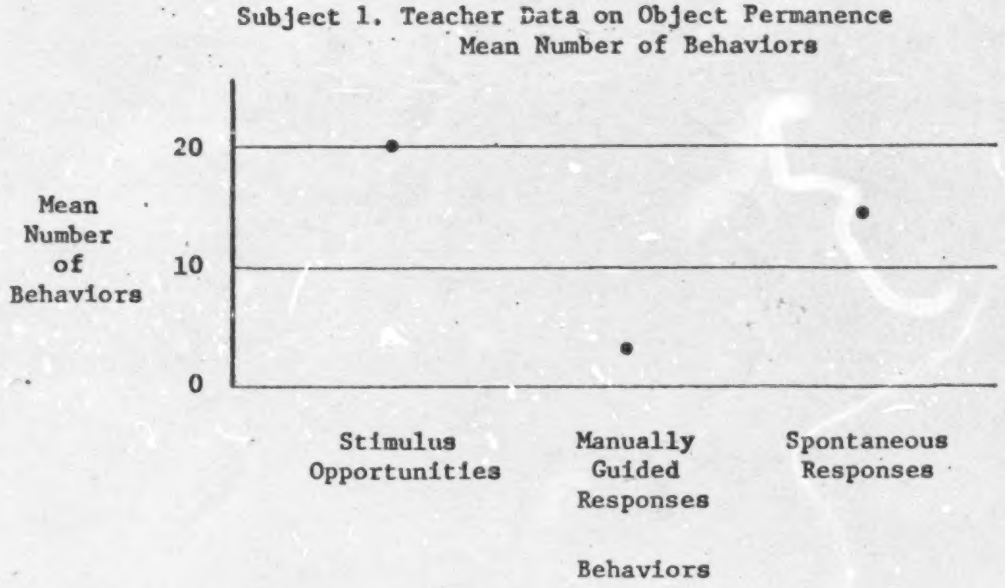
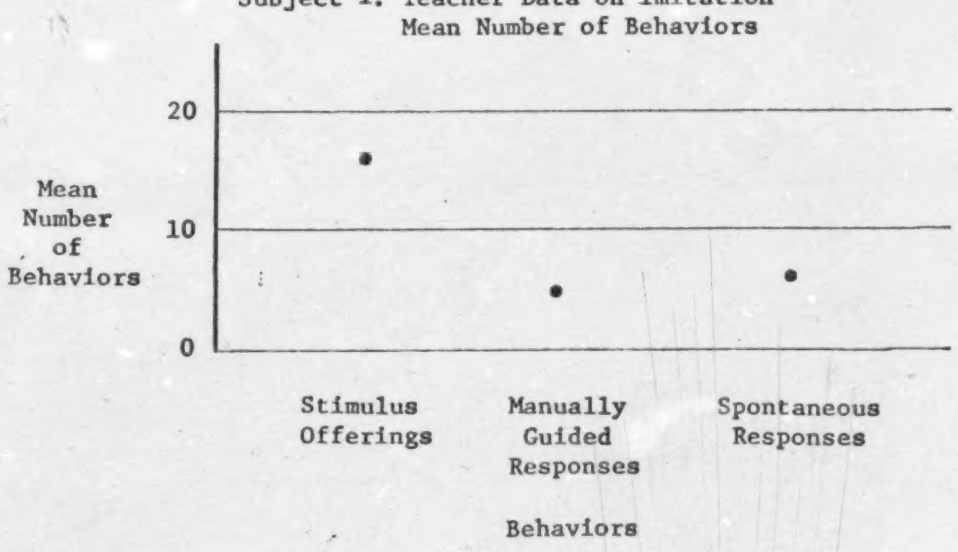


FIGURE 7



of 15 times, and was manually guided a mean of three responses per lesson. On the Imitation portion of the program (Figure 7), Subject 1 received a mean of 16 offerings and was manually guided through about half of the responses. During the lessons, the teacher reported that the child often seemed nonresponsive but that the child became more attentive to the classroom environment as the lessons progressed, maintained better eye contact with the teacher and seemed to be seeking additional input from the teacher once the experimental program had ended.

Teacher data for Subject 2 (Figures 8 and 9) show a mean of nine manually guided responses and six spontaneous responses on Object Permanence lessons. This subject appeared to have required manual guidance for over half of the 15 response offerings per lesson. The child made no spontaneous responses on Imitation during the course of the program. The teacher reported that although the child always did some responding she reached criterion only once and therefore never moved beyond the second Object Permanence lesson and the first Imitation lesson. The child was reported to have formed a strong attachment with her teacher and sought her during the day. Also, the child began exploring the room, studying herself in the mirror and occasionally babbled, although this behavior was not observed during the prelanguage lesson.

Figures 10 and 11 show the teacher data for Subject 3. Note that for this child on Object Permanence manually guided responses were not needed. The child spontaneously offered some response for almost every stimulus opportunity provided. The child also showed some inconsistent spontaneous imitations. The teacher reported, in reference to the Imitation portion of the lesson, that the child seemed hesitant to act on his own body but occasionally would perform imitative acts upon the teacher's body, e.g., clap the

FIGURE 8

Subject 2. Teacher Data on Object Permanence
Mean Number of Behaviors

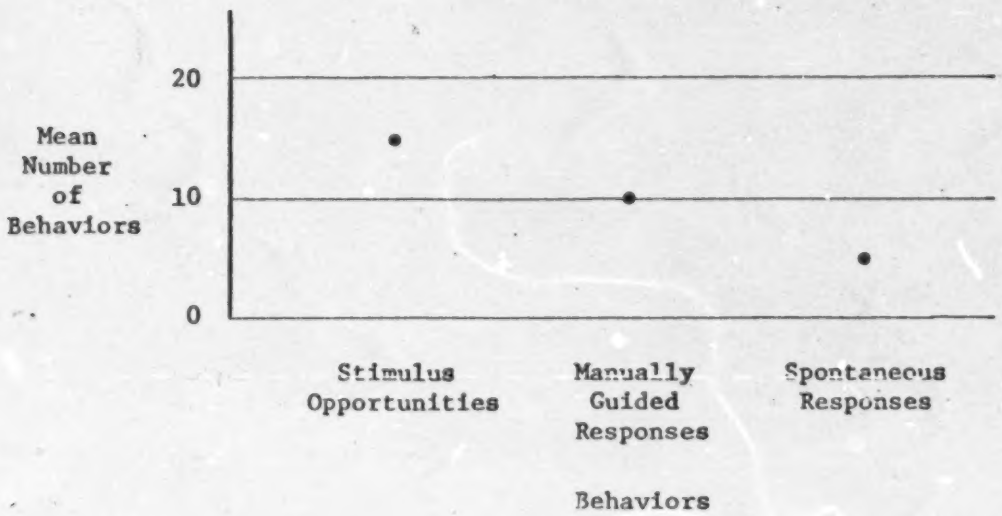


FIGURE 9

Subject 2. Teacher Data on Imitation
Mean Number of Behaviors

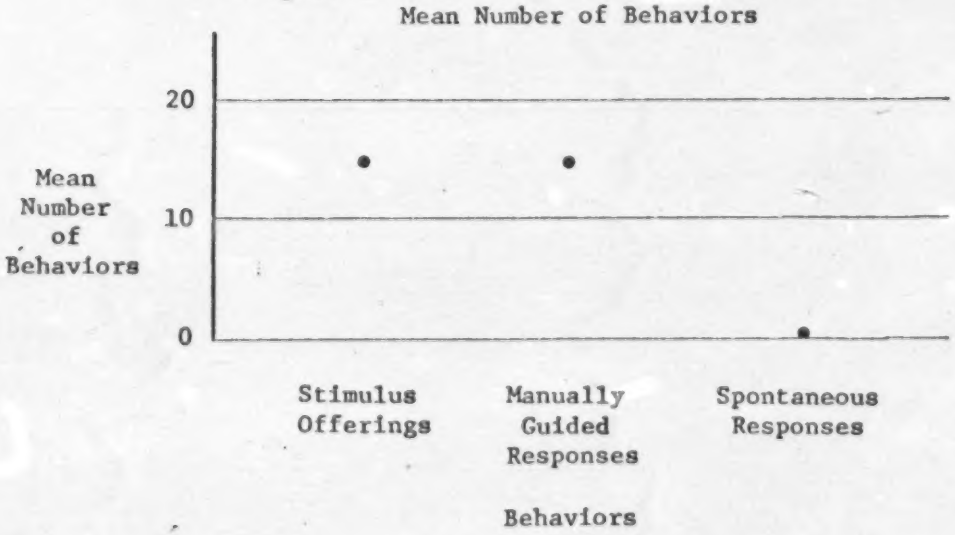


FIGURE 10

Subject 3. Teacher Data on Object Permanence
Mean Number of Behaviors

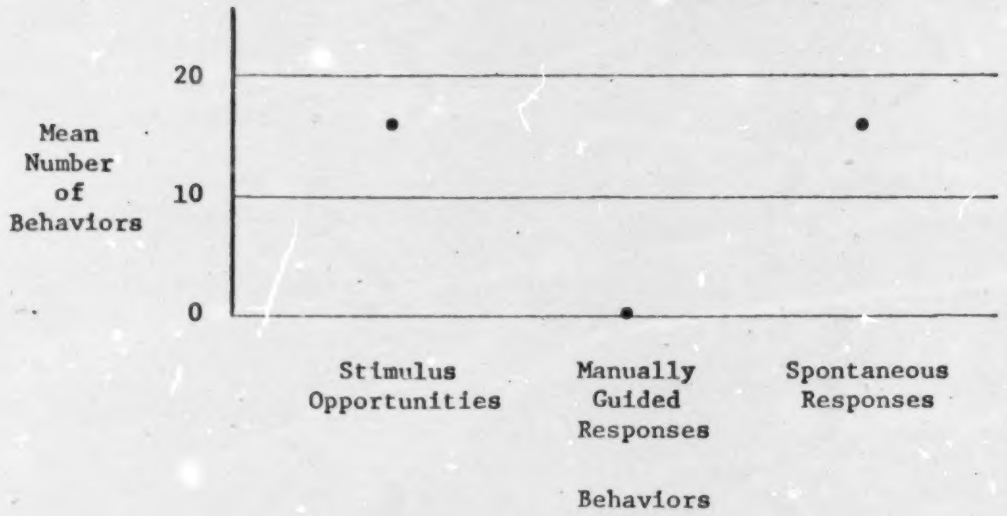
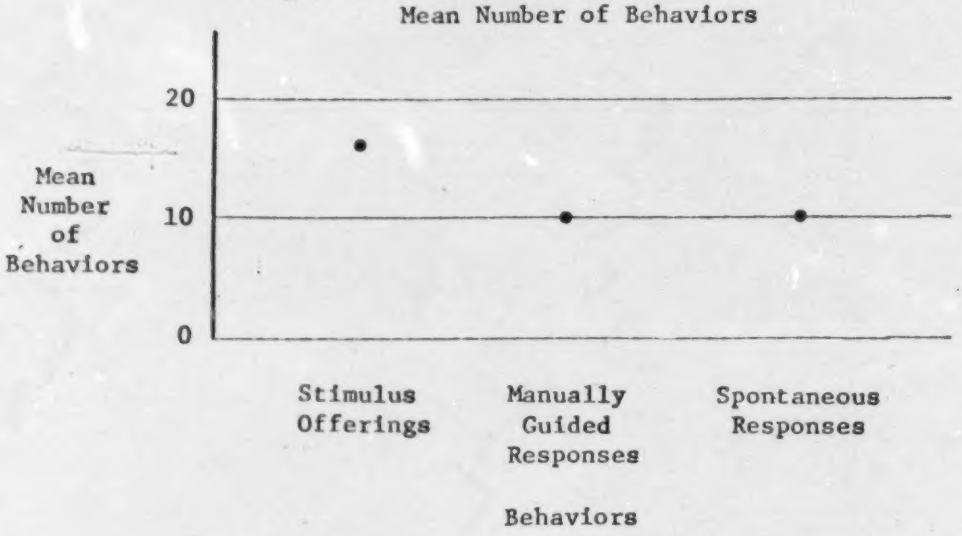


FIGURE 11

Subject 3. Teacher Data on Imitation
Mean Number of Behaviors



teacher's hands together after she had done so. The teacher believed the Object Permanence portion of the program to be most useful in orienting the child toward a structured situation with appropriate object play.

Data on teacher responses for Subject 4 appear in Figures 12 and 13. Note that for a mean of 10 offerings per lesson on Object Permanence, the child used spontaneous responses for about half the offerings and was manually guided for the other half. On Imitation, the child received a mean of 10 offerings and spontaneously responded to a mean of two of them. Manual guidance was therefore used to elicit most of the Imitation responses. Throughout the lessons the teacher reported that although the child did show some gains, the lessons seemed to exceed his attention span, and the subject became disagreeable as the project progressed.

Figures 14 and 15 show the teacher data collected for Subject 5. Note that on Object Permanence, the child was manually guided for about half of the responses emitted during the lesson. On Imitation, the child was manually guided for over half of the responses emitted and offered a mean of only four spontaneous imitations per lesson. The child, as reported by the teacher, enjoyed the lessons and seemed to become more attentive as the program progressed.

Conclusions and Implications

The results suggest a number of implications to the educator of severely retarded children. Although some learning occurred, especially in the area of object permanence, gains were not substantial for any subject. The fact that these children were not only severely retarded , but demonstrated a variety of disturbed behaviors must be considered. Inappropriate and self-stimulating behaviors disrupt the underlying interaction between the model and the learner and between the learner and the stimuli of his/her external environment. Teachers reported that children became very restless during the

FIGURE 12

Subject 4. Teacher Data on Object Permanence
Mean Number of Behaviors

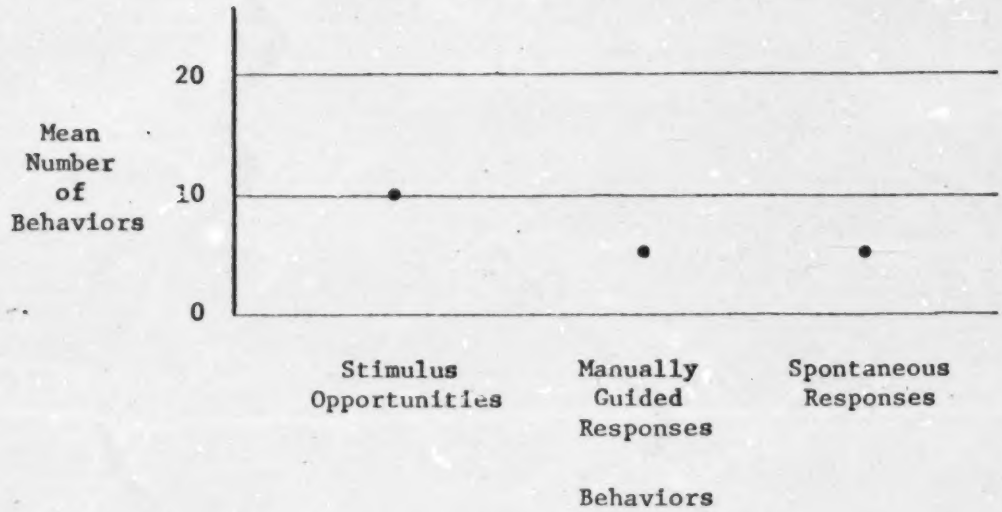


FIGURE 13

Subject 4. Teacher Data on Imitation
Mean Number of Behaviors

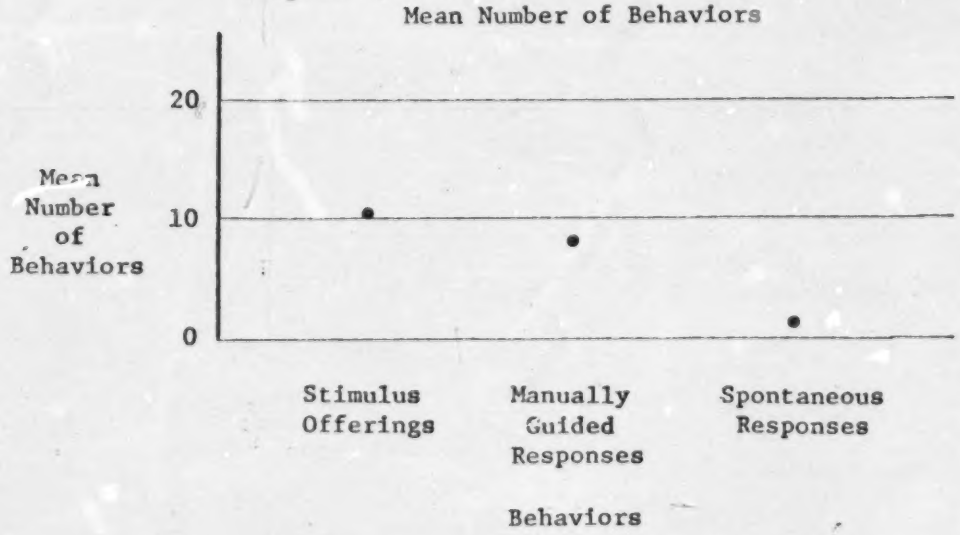


FIGURE 14

Subject 5. Teacher Data on Object Permanence
Mean Number of Behaviors

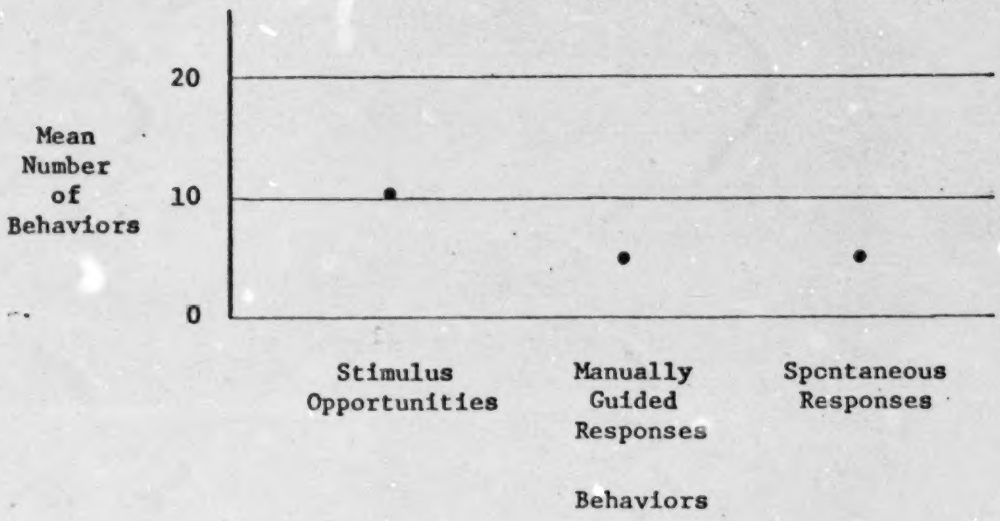
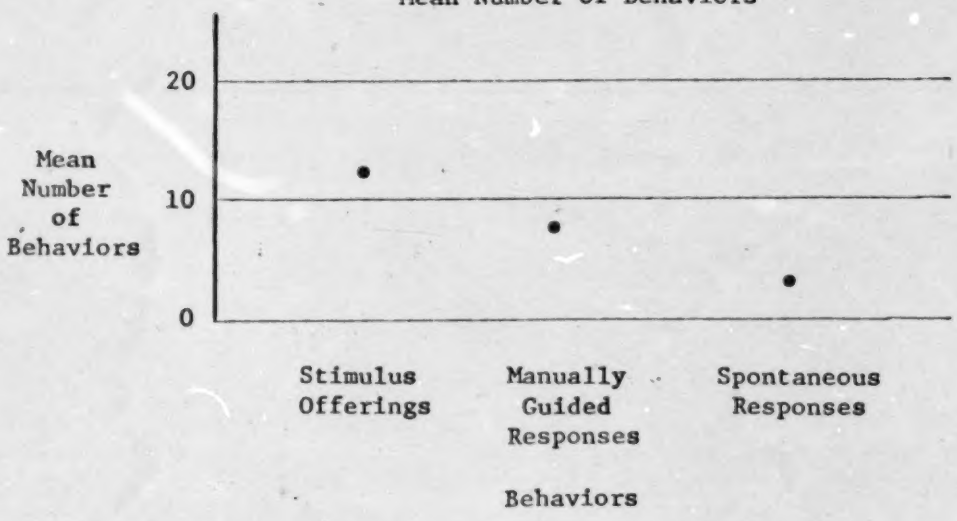


FIGURE 15

Subject 5. Teacher Data on Imitation
Mean Number of Behaviors



lesson and often refused to be manually guided through an activity. Obtaining imitative behavior, either gestural or vocal, was almost an impossibility. This suggests not only inattention in the learning interaction but resistance in giving responses.

Upon reflection, it appears that training object permanence by using manipulative activities that encourage exploratory behavior may be a valid approach. On the other hand, the approach used for stimulating imitative behavior is probably inappropriate for children who withdraw from interaction. A revision of the sequence to train imitative behavior is in process. It will stress establishing interaction, primarily physical, between teacher and child prior to requiring the child to copy an imitative model offered by the teacher.

The work described in this report is one step in a potential line of research on programmatic language issues with severely retarded children. Continued efforts to design and implement language programs for children stressing prerequisite skills focused on the functional rather than chronological age level of the child seem to be an appropriate approach to programming for this difficult and often ignored population.

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FOOTNOTES

[1]This project was supported by the Minnesota Easter Seal Society and the East Metropolitan Day Activity Center Council (EMDACC).

[2]Mary Lynne McAlonie is the Minnesota Easter Seal Society's Preschool Language Development Consultant presently consulting to the East Metropolitan Day Activity Center Council (EMDACC). Judith Wolf is an Assistant Professor in the Department of Educational Administration and the Institute of Child Development at the University of Minnesota.

IDENTIFICATION

Mary Lynne McAlonie

M.A. Speech Pathology
St. Cloud State University
St. Cloud, MN

Language consultant to East Metropolitan Day Activity Center Council (EMDACC).

Judith M. Wolf

PhD. Psychoeducational Studies
University of Minnesota
Minneapolis, MN

Assistant Professor
Institute of Child Development and
Educational Administration
University of Minnesota